HD3

HIGH DENSITY INTERFACE

with automatic
step rate adaption

Bitz Computers

Introduction

High Density (HD) drive mechanisms, which can work at both 360/ 720 kb and 1.44 Mb densities, are now available.

The BITZ HD3 interface allows 1 or 2 HD drives to be used with an ATARI ST in place of the normal Double Density (DD) drives.

The interface manages the switchover between HD and DD operation and permits the use of both 3.5" (1.44 Mb) and 5.25" (1.2 Mb) diskettes.

This interface controls the automatic selection of the step rate so that, unlike other interface units, the BITZ interface does NOT require software control of the step rate.

Operation

The floppy drive controller in the ST is the WD 1772 integrated circuit (IC).
This IC normally operates (in DD mode) at 8 Mhz.
In order to use HIGH DENSITY drives, this controller has to work at 16 Mhz. speed.

Most of the WD1772 PH 02-02 controllers commonly found in STs,can operate at 16 Mhz. and provide a HD mode.

In older ST models the WD1772 PH 00-02 type of floppy disk controller is occasionally found.
This type is NOT suitable for 16 Mhz. operation, and must be changed to acheive HD mode.

The interface is switched between DD and HD modes by a signal which is either 0 V (DD) or 5 V (HD).
This signal is generated by a sensor in the drive mechanism, detecting the supplementary hole in HD diskettes.

Installation

The interface PCB will be installed above the floppy disk controller.

First, pin 18 of the WD 1772 must be disconnected. Cut the pin as close as possible to the mother board and bend it upwards so that in cannot touch the mother board.

Install the interface PCB on top of the WD 1772 (refer to fig. 1) and solder the 7 interface pins to the corresponding pins on the WD 1772.
One of the pins, which is shorter than the others, is positionned just above the bent-up pin 18 on the WD 1772, and should be soldered to this bent up pin.

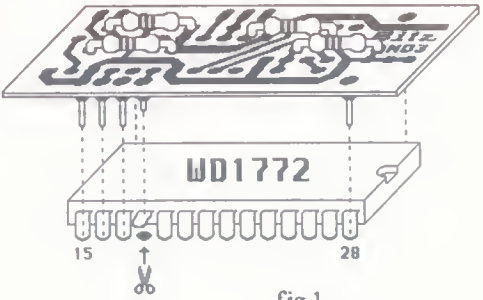

fig.1

The RED wire from the interface (connection pin 3) has to be connected to pin 20 of the YAMAHA sound ic (YM2149 or AY-3-8910).

The YELLOW wire from the interface (connection pin 2) has to be connected to pin 19 of the same YAMAHA sound ic.

The BLACK wire from the interface (connection pin 1) has to be connected to pin 39 of the video shifter ic (CO25914-38A or IMP CO70713-002).
This black wire must be kept as short as possible as it carries a 16 Mhz. signal.

Note that on 520 and 1040 STs, the video shifter ic is screened within a metal box.

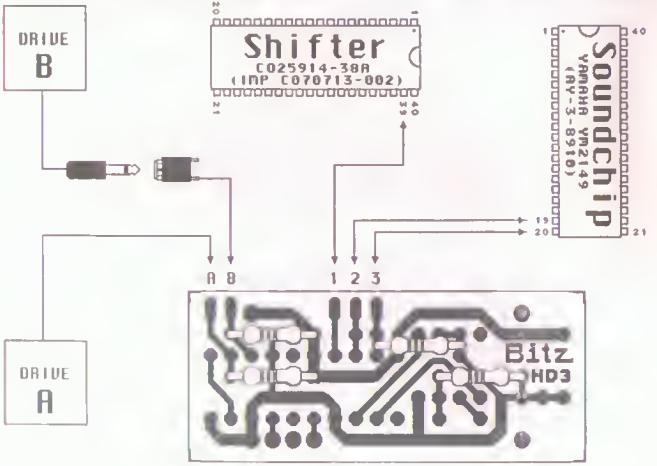

fig.2 (layout)

At this point, the computer should function normally and it should be checked for proper operation before continuing with the installation of the BITZ HD 3 interface.

There are now 2 connections remaining to be made on the interface:
A: select DD or HD for drive A.
B: select DD or HD for drive B.

For both connections the drive functions:
*) in normal mode (DD) if the signal is logic 0 (0 v)
*) in HD mode if the signal is logic 1 (5 v).

If not used, a connection may be left disconnected, and will work in normal (DD) mode.

For example: If internal drive A is to remain unmodified −720 kb / DD− and drive B is to be the external HD disk drive −720 kb and 1.44 Mb−, connection A will be unused and connection B will be made to drive B.

Connection of an external HD drive

If an external HD drive is installed, the small jack socket has to be fitted on the computer to allow the disk drive to be connected to B of the interface.
Most commercially available external HD drives have both standard disc drive connection sockets and a small jack socket plug. This little connector carries the HD disk detection signal.

Connection of an internal HD drive

Any normal HD drive mechanism can be connected to the interface once the necessary HD signal line has been located.
Unfortunately, the position and type of this line differs with the different brands and types of drives.
Some drives can export this signal from pin 2 of the SHUGART connector, usually by selection or adjustment of some jumpers.
Other drives need to have the signal tapped off some were else internally.
Once the signal line has been located, it should be connected to A of the interface.
(Consult your agent if you cannot locate this signal).

Note: The HD signal is originated by the drive and carries 0 v if there is a DD disc in the drive, and 5 v if there is a HD disc in the drive (a HD disc can be recognised by its supplementary hole).

Software

– BITZCOPY.PRG

Using the BITZCOPY program provided, diskettes may be formatted and copied (DD as well as HD).
This software can be used as a programme (name extention .PRG), or as an accessory (name extention .ACC).
The file name extension should be selected to correspond with the use of this programme.

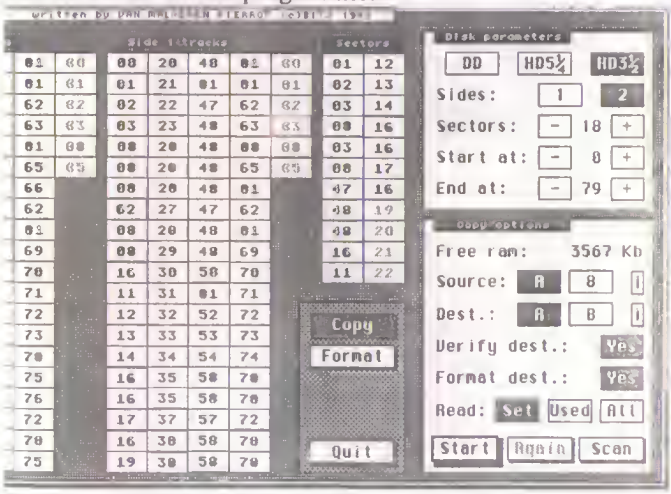

fig.3 (Bitzcopy)

– ENABLEHD.PRG

When TOS 2.06 is installed, it is possible to format HD discs from the GEM desktop.
In the case of a computer which is not an STE, but which has TOS 2.06 installed (e.g. by means of the BITZ Tos Decoder...), this ENABLEHD program will put the HD button on the screen in the formatting section of the GEM desktop.
The best way to activate this function is to place the ENABLHD program in an AUTO folder on the boot partition.

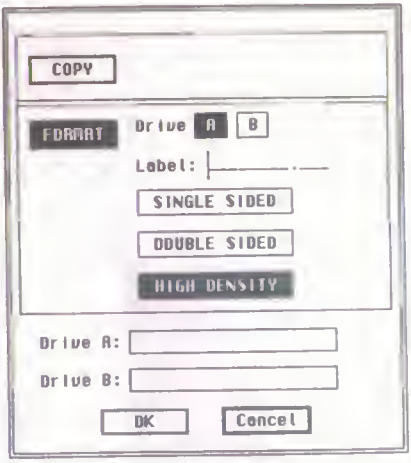

fig.4 (GEM)